

Work Order ID 69335

Monday, May 09, 2011 10:29:43 AM



Page 1

Item ID: D212-664-101

Revision ID:

Item Name: Crosstube Fwd

Start Date: 5/9/2011 Start Qty: 1.00

Required Date: 5/12/2011 Req'd Qty: 1.00

Reference:

Approvals: Process Plan:

Date: 11-05-11

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

| Draw Nbr | Revision Nbr |
|--------------|--------------|
| D212-664-141 | Rev D |

100



DC

Document Control

DOCUMENT CONTROL

Memo

Photocopy bluefile and create labels as per PPP D212-664-101 CHG003

0.00

0.00

110



Packaging

Packaging

Pick Kit
Packaging

Memo

0.00

0.00

120



CNC Bend-2

CNC Alpha 160 Bender

BENDING MACHINE - CROSSTUBES

Memo

Bend tube as per Dwg D212-664-141 using CNC bender program 212-1w and Folio D212-664-101

0.00

0.00

Handwritten: 11-5-27

Handwritten: 11-5-16

Handwritten: 11-5-16

Handwritten: D212664101 B69335

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
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NOTE: Date & initial all entries

Work Order ID 69335

Monday May 09, 2011 10:29:44 AM



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Item ID: D212-664-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd

Start Date: 5/9/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 5/12/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: Date: Tooling: Date:

Stop



QC: Date: SPC (Y/N): Date:

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

130

QC15- Crosstube Dimensional Check

0.00



QC

Memo

0.00

Quality Control

140

Crosstubes

0.00



Crosstubes

Memo

0.00

Crosstubes

1-Drill pilot holes in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549, using drill table DT8577, set-up towers in hole #7 as per QSI 10

2-Ream hole to finish size in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-141

4-Deburr & inspect for surface damage. Repair damage within limits as per Dwg D212-664-141

Sub 116

DP

SAD
11-05-16

SAD
11-05-17

40

1

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|---|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 150 | Crosstubes Chemical Conversion | 0.00 | | | | | | | |
| | | | | | | | | | |
| HandFXtube | Memo | 0.00 | | | | | | | |
| Hand Finishing Crosstubes | Chemical Conversion Coat within 24 hours of bending and drilling | | | | | | | | |
| | | | | | | | | | |
| 160 | QC5- Inspect part completeness to step on W/O | 0.00 | | | | | | | |
| | | | | | | | | | |
| QC | Memo | 0.00 | | | | | | | |
| Quality Control | | | | | | | | | |
| | | | | | | | | | |
| 170 | Outsource process - NDT per QSI038 4.1 | 0.00 | | | | | | | |
| | | | | | | | | | |
| Outsource2 | Memo | 0.00 | | | | | | | |
| Outsource process - NDT | Liquid Penetrant Inspection as per QSI 038 Issue P/O: 1447 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order | | | | | | | | |

SAD 11-05-17

Sadler

POSITIVE RECALL

EFFECTIVE 11/05/18 AUTH A

RELEASED Sa DATE 11/05/18

CL 11/05/18 (1)

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Monday, May 09, 2011 10:29:44 AM

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Start Date: 5/9/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 5/12/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|---|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 180 | Receive & Inspect for Damage & Mat'l Certs | 0.00 | | | | | | | |
| | Packaging | | | | | | | | |
| Packaging | Memo | 0.00 | | | | | | | |
| Packaging | Ensure copy of NDT results attached to work order. | | | | | | | | |
| 190 | QC5- Inspect part completeness to step on W/O | 0.00 | | | | | | | |
| | | | | | | | | | |
| QC | Memo | 0.00 | | | | | | | |
| Quality Control | Inspect for damage & ensure results are as per Dwg D212-664-141 | | | | | | | | |

Handwritten signature 11-05-18

Handwritten signature 11-05-18

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Item ID: D212-664-101

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Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd

Start Date: 5/9/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 5/12/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200



SprayPaint

Spray Painting

Spray Painting per QSI005 4.2
SprayPaint

0.00

Memo

0.00

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube as per DEO D212-667-141 with White Imron as per QSI 005 4.2

PRIME:

Start Time: _____

Finish Time: _____

11-05-19

PAINT:

Start Time: _____

Finish Time: _____

11-05-19

11-05-19



210



QC

Quality Control

QC14- Inspect Spray Paint

0.00

Memo

0.00

Then, Wrap in plastic bag to protect from scratches

8 ulosko



| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
| | | | | | | | |

Part No: D212-664-101 PAR #: _____ Fault Category: Landing gear NCR: Yes No DQA: AK Date: 11.05.30
 Resolution: Re work Disposition: Re work QA: N/C Closed: OK Date: 11/05/30

| NCR: 69335 | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------------|------|--|--------------------------------|---|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| 11/05-20 | 210 | clusters of tears or more fish eyes in paint in a 1" x 1" square R.C. contamination / Process | 11.05.26 Q5104Z | sand down paint from support down (white only) & and re paint as per Q51005 ONLY FINISH IS AFFECTED | 21 11-05-26 | S 11/05/27 | 11.05.26 Q5104Z | S 11/05/27 |
| | | | | | | | | |
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NOTE: Date & initial all entries

Work Order ID 69335

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Item ID: D212-664-101

Accept

Setup Start

Revision ID:

Stop

Item Name: Crosstube Fwd

Start Date: 5/9/2011 Start Qty: 1.00

Cust Item ID:

Required Date: 5/12/2011 Req'd Qty: 1.00

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 220 | Crosstubes | 0.00 | | | | | | | |
| | Crosstubes | | | | | | | | |
| | Crosstubes | | | | | | | | |
| | Memo | 0.00 | | | | | | | |
| | 1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe | | | | | | | | |
| | 2-Install supports with magnobond as per QSI 015 Adhere for for 12 Hrs A/R 6398 Magnobond Batch: 116677 | | | | | | | | |
| | 3- Torque bolts as per dwg | | | | | | | | |
| 230 | QC6- Inspect dimensions to drawing | 0.00 | | | | | | | |
| | QC | | | | | | | | |
| | Quality Control | | | | | | | | |
| 240 | Pick Kit | 0.00 | | | | | | | |
| | Packaging | | | | | | | | |
| | Packaging | | | | | | | | |

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
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NOTE: Date & initial all entries

Work Order ID 69335

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Item ID: D212-664-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd

Start Date: 5/9/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 5/12/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

250

QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

8/10/07

Quality Control

260

Packaging

0.00



Packaging

Memo

0.00

Rec'd

Packaging

Identify and pack for shipping as per PPP D212-664-101

11/5/07

270

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

11/5/30

11-05-30

(1)

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

Picklist Print

Monday, May 09, 2011 10:29:50 AM

Page 1

Work Order ID: 69335

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd



Start Date: 5/9/2011

Required Date: 5/12/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:E 04.02.16 Reformat KJ/DS
 IPP Rev:F 06-03-29 Remove Coments on Pick List JLM
 IPP Rev:G 07-04-30 As per Rev C JLM IPP Rev:H
 11.04.26 inspection strip ecn 11-549 EC verified by:DD

| Component Item ID/ Item Name | Replacement Item ID | Mfg/ Purch | Bin Item | Primary Location | Last Location | Route Seq ID | Unit of Measure | Qty on Hand | Qty per Kit | Total Qty | Qty Issued | Date Issued | Status |
|---|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
| D212-664-101TRN  | | Manufactured | No | B69126 | | 110 | Each | 0.0000 | 1 | 1 | 1 | 11-5-16 | |
| Crosstube Turning Detail | | | | | | | | | | | | | |
| D3595-063-450  | | Manufactured | No | | | 230 | Each | 81.5400 | 4 | 4.210526 | | 11-05-24 | |
| RUBBER CUSHION | | | | | | | | | | | | | |

Location Loc Qty Loc Code

LG 52
 67353 7
 68893 45
 LG055 29.54
 68157 29.54

MS21920-24

Purchased

No

220

Each

52.0000

4

4



Clamp(per MIL-DTL-8783C)

108258

Location Loc Qty Loc Code

LG050 52
 116264 2
 117279 50

DT0

| W/O: | | WORK ORDER CHANGES | | | | | |
|-------|------|--|----|----------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| 10524 | | install - 24 clamps - 25 no more stock - 26 too long | BT | 11-05-24 | | 11.05.25 Q51042 | |
| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Monday, May 09, 2011 10:29:50 AM

Work Order ID: 69335

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd

Start Date: 5/9/2011

Required Date: 5/12/2011

Start Qty: 1.00

Required Qty: 1.00

D2893-1 Manufactured No

220 Each

7.0000

2 2



2.75 Support

68799 x 2



ST 11-05-24

Location

Loc Qty

Loc Code

LG052

15

ST

7

67619

7

D3428-1 Manufactured No

240 Each

27.0000

1 1



Placard



SP 1

Location

Loc Qty

Loc Code

ST053

27

66961

7

68920

20

AN6-35A Purchased No

240 Each

74.0000

4 4



BOLT



SP

Location

Loc Qty

Loc Code

ST343

74

116528

44

117441

30

AN6-36A Purchased No

240 Each

89.0000

4



Bolt



4 11/5/07 SP

Location

Loc Qty

Loc Code

ST343

89

117313

9

117441

80

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
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NOTE: Date & initial all entries

Picklist Print

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Page 3

Work Order ID: 69335



Parent Item: D212-664-101



Parent Item Name: Crosstube Fwd

Start Date: 5/9/2011

Required Date: 5/12/2011

Start Qty: 1.00

Required Qty: 1.00

MS21042L6

Purchased

No

240

Each

298.0000

6



Nut



6

Location

Loc Qty

Loc Code

ST300

298

117343

298

AN960JD616

NAS1149D0663J

Purchased

No

240

Each

0.0000

18



Washer



18

11/7/29/11 11/5/27-8

Monday, May 09, 2011 10:29:50 AM

Shop Packet Print

Page 3

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
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| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

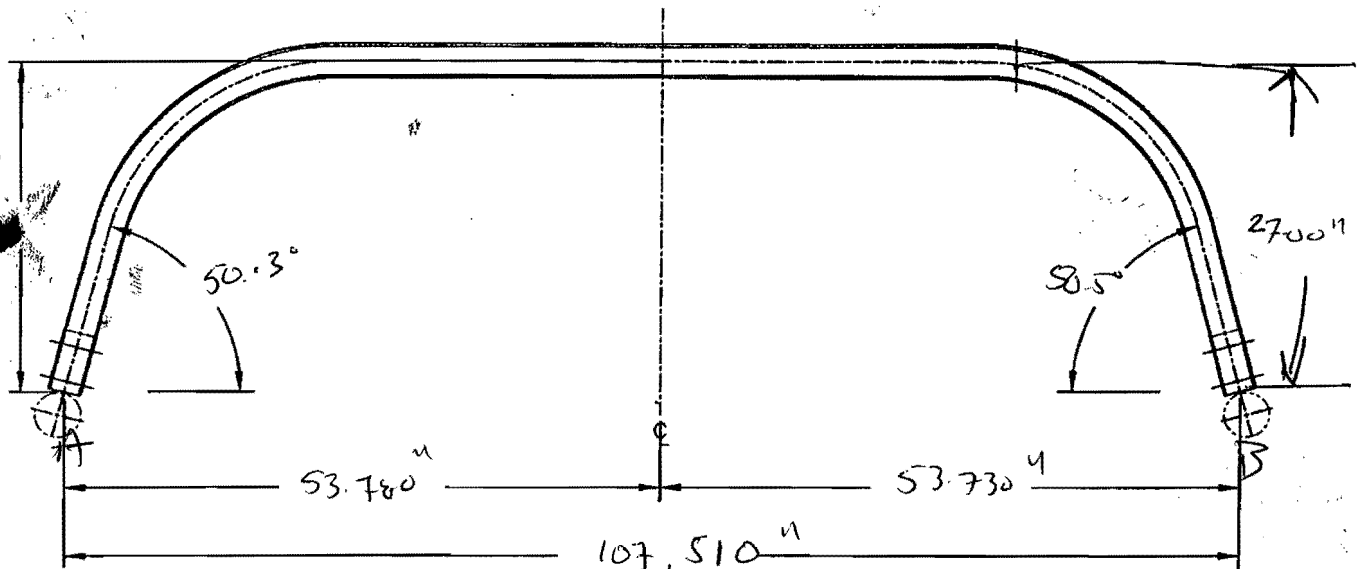
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

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|--|--|---------------------|--------------|
| DART AEROSPACE LTD | | Work Order: | 09335 |
| Description: Crosstube High Fwd (205/212/412) | | Part Number: | D212-664-101 |
| Inspection Dwg: D212-664-141 Rev: D | | Page 1 of 1 | |

| Required Dimension | Min | Max |
|--------------------|--------|-------|
| Height | 26.79 | 27.05 |
| 1/2 Span | 53.59 | 53.85 |
| Angle | 49 | 52 |
| Total Span | 107.18 | 107.7 |



| Comments |
|----------|
| |
| |
| |
| |

| | |
|-----------------|----------|
| QC15 Inspection | 8 |
| Date | 11/05/16 |

| Rev | Date | Change | Revised by | Approved |
|-----|----------|----------------------------------|------------|----------|
| A | 07.02.06 | New Issue | KJ/JM | |
| B | 07.05.31 | Dimensions updated per Dwg Rev C | KJ/JM | |
| C | 10.04.01 | Dwg Rev updated | KJ | |

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
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| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| | | | | | | | | |
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| | | | | | | | | |

NOTE: Date & initial all entries

| Item | Qty -141 | Qty -141B | Part Number | Description |
|------|-------------|--------------|----------------|---|
| 1 | X | | D212-664-141 | CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD) |
| 2 | | X | D212-664-141B | CROSSTUBE ASSEMBLY (214 HIGH FWD) |
| 3 | 1 | 1 | D6005-128 | CROSSTUBE |
| 4 | 2 | 2 | D2893-1 | SUPPORT |
| 5 | 4 | 4 | D3595-063-450 | RUBBER CUSHION |
| 6 | 4 | 4 | MS21920-25 | CLAMP (OR MS21920-26) |
| 7 | A/R | A/R | MAGNOBOND 6398 | ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE) |

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 126.514±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF
USING VIBRATING STYLUS
- 7) WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664)
D212-664-141B = 33.6 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS
6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF
D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE
SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE
SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR
DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND
MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT
HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 11-05-9

DEO ATTACHED

RELEASED
2009-10-29

| | | | |
|------------|--|---|----------|
| D | REFORMAT/REVISE GENERAL NOTES/PART LIST, REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C8-3 & B6-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4 | RF | 09.09.30 |
| C | REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS | PH | 07.03.08 |
| B | ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES | PH | 05.02.04 |
| A | NEW ISSUE | PH | 00.12.12 |
| REV. | DESCRIPTION | BY | DATE |
| DESIGN | PH | DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA | |
| DRAWN | RF | DRAWING NO. REV. D D212-664-141 SHEET 1 OF 4 | |
| CHECKED | PH | TITLE SCALE XTUBE ASS'Y (205/212/412 HI FWD) NTS | |
| MFG. APPR. | PH | DATE 09.09.30 | |
| APPROVED | PH | COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR LOANED OR REPRODUCED IN ANY OTHER MANNER WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD. | |
| DE APPR. | PH | | |

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
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NOTE: Date & initial all entries

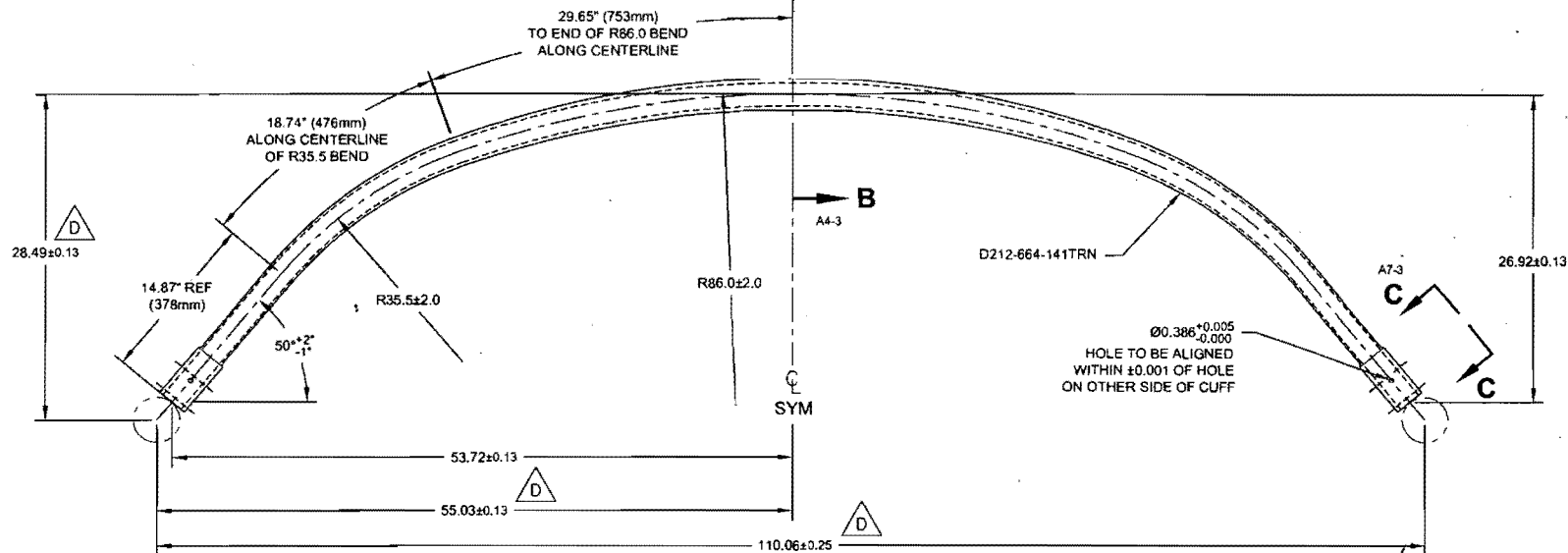
| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

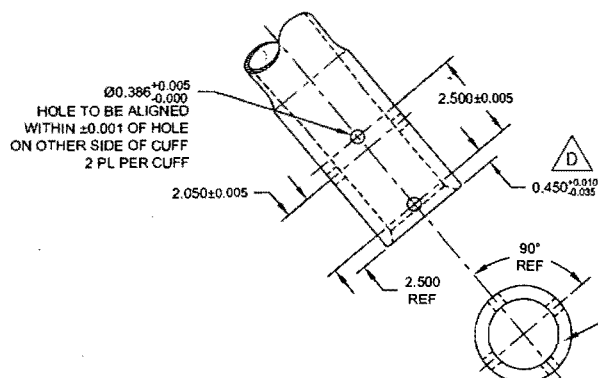
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
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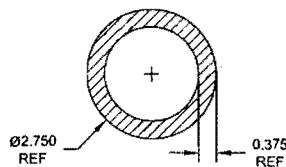
NOTE: Date & initial all entries



D212-664-501
BENDING AND DRILLING DETAIL



VIEW C-C: CUFF DETAIL
SCALE 3X



SECTION B-B
SCALE 4X

| | | | |
|------------|----------|---|--------------|
| DESIGN | PH | DART AEROSPACE LTD | |
| DRAWN | RF | HAWKESBURY, ONTARIO, CANADA | |
| CHECKED | Q | DRAWING NO. | REV. D |
| MFG. APPR. | S | D212-664-141 | SHEET 3 OF 4 |
| APPROVED | JP | TITLE | SCALE |
| DE APPR. | JP | XTUBE ASSY (205/212/412 HI FWD) | NTS |
| DATE | 09.09.30 | <small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMING OR COMMING TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small> | |

DEO ATTACHED

RELEASED
2009-10-29

u/b 69335

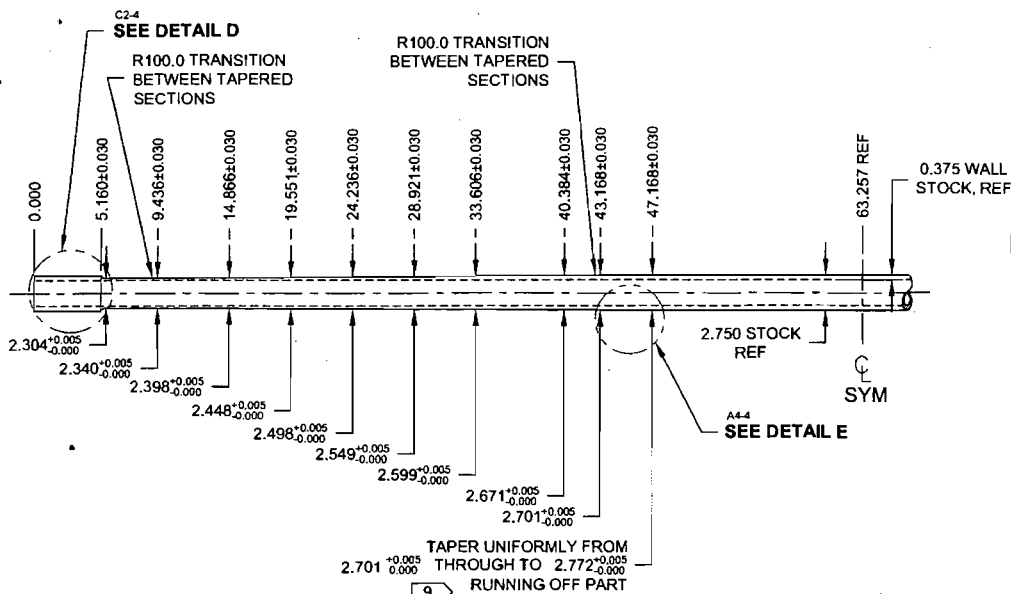
| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

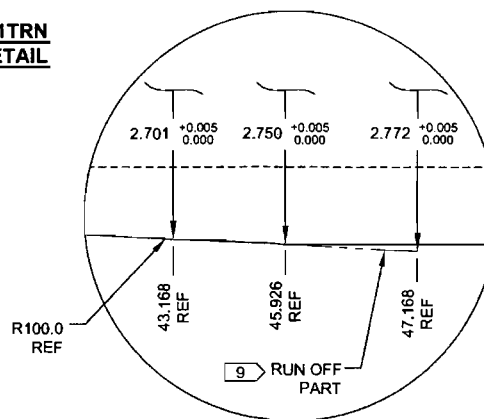
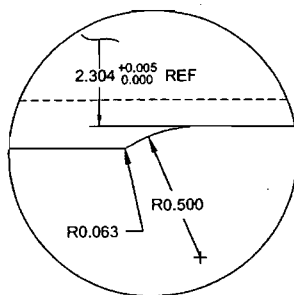
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
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| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
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NOTE: Date & initial all entries



D212-664-141TRN
TURNING DETAIL



DETAIL D:
CROSSTUBE CUFF D6-4
SCALE 5X

u/o 69335
DEO ATTACHED

RELEASED
2009-10-29

| | | | |
|---|----------|--|--------------|
| DESIGN | PH | DART AEROSPACE LTD | |
| DRAWN | RF | HAWKESBURY, ONTARIO, CANADA | |
| CHECKED | QP | DRAWING NO. | REV. D |
| MFG. APPR. | DS | D212-664-141 | SHEET 4 OF 4 |
| APPROVED | AP | TITLE | SCALE |
| DE APPR. | AP | XTUBE ASS'Y (205/212/412 HI FWD) | NTS |
| DATE | 09.09.30 | COPYRIGHT © 2000 BY DART AEROSPACE LTD | |
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| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

| | | | | | | | |
|-----------------------------|--|--------|---|----|--------------------------------|---------------------------|---------------|
| DRAWING NO. D212-664-141 | TITLE XTUBE ASSY (205/212/412 HI FWD) | REV. D | DART AEROSPACE LTD ENGINEERING ORDER | | D.E.O. NO. D212-664-141-D-1 | SHEET NO. SHEET 1 OF 2 | SCALE NTS |
| DRAWN | CHECKED | MP | MFG. APPR. | ER | APPROVED | MP | DE APPR. |
| DATE 11.04.07 | DATE 11.04.11 | | DATE 11.04.12 | | DATE 11/04/12 | | DATE 11.04.12 |

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

RELEASED
2011-04-18

u/b 69335

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

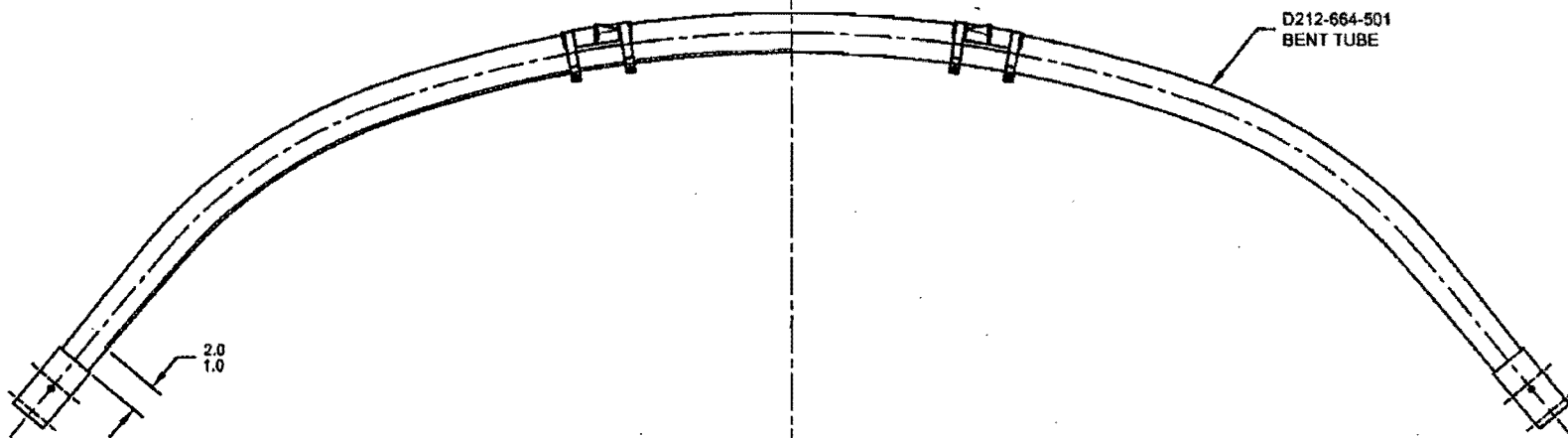
| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
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NOTE: Date & initial all entries

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|-----------------------------|--|----------------------|---|--------------------------------|---------------------------|--------------|
| DRAWING NO. D212-664-141 | TITLE XTUBE ASSY (205/212/412 HI FWD) | REV. D | DART AEROSPACE LTD ENGINEERING ORDER | D.E.O. NO. D212-664-141-D-1 | SHEET NO. SHEET 2 OF 2 | SCALE NTS |
| DRAWN | CHECKED <i>CP</i> | MFG. APPR. <i>CE</i> | APPROVED <i>WAD</i> | DE APPR. <i>WAD</i> | | |
| DATE 11.04.07 | DATE 11.04.11 | DATE 11.04.12 | DATE 11/04/12 | DATE 11.04.12 | | |

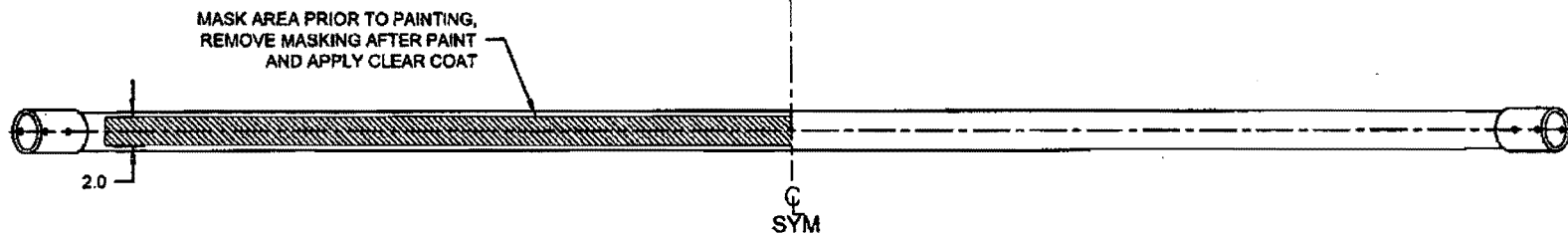
IS:

WAS:



**D212-664-141/-141B
ASSEMBLY DETAIL**

u/o 69335



| W/O: | | WORK ORDER CHANGES | | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|--|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector | |
| | | | | | | | | |
| | | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|--------------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| | | | | | | | | |
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NOTE: Date & initial all entries

REFERENCE ONLY**5.0 PARTS LIST****5.1 HIGH GEAR CROSSTUBES**

| Item | -101 | -201 | -203 | Part Number | Description |
|------|------|------|------|------------------|--|
| | X | | | D212-664-101 | CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD |
| | | X | | D212-664-201 | CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT |
| | | | X | D412-664-203 | CROSSTUBE INSTALLATION, 412 HIGH AFT |
| 1 | 1 | | | D212-664-141 | CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD |
| 2 | | 1 | | D212-664-241 | CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT |
| 3 | | | 1 | D412-664-243 | CROSSTUBE ASSEMBLY, 412 HIGH AFT |
| 10 | 2 | | | * D2893-1 | SUPPORT |
| 11 | 4 | | | * D3595-063-450 | RUBBER CUSHION |
| 12 | 4 | | | * MS21920-25 | CLAMP (OR MS21042-26) |
| 13 | 4 | | | AN6-35A | BOLT |
| 14 | 4 | | | AN6-36A | BOLT |
| 15 | 6 | | | MS21042L6 | NUT (OR MS21042-6) |
| 16 | 18 | | | AN960JD616 | WASHER |
| 20 | | 2 | | * D2940-1 | SUPPORT |
| 21 | | 4 | | * D3595-063-530 | RUBBER CUSHION |
| 22 | | 4 | | * MS21920-28 | CLAMP (OR MS21042-30) |
| 23 | | 4 | | AN6-40A | BOLT |
| 24 | | 2 | | AN6-41A | BOLT |
| 25 | | 6 | | MS21042L6 | NUT (OR MS21042-6) |
| 26 | | 18 | | AN960JD616 | WASHER |
| 30 | | | 1 | * D2896-1 | SUPPORT |
| 31 | | | 2 | * D2856-600-1009 | ABRASION STRIP |
| 32 | | | 2 | * D3595-063-570 | RUBBER CUSHION |
| 33 | | | 4 | * MS21920-28 | CLAMP |
| 34 | | | 2 | * MS21920-30 | CLAMP (OR MS21042-32) |
| 35 | | | 4 | AN6-40A | BOLT |
| 36 | | | 2 | AN6-41A | BOLT |
| 37 | | | 6 | MS21042L6 | NUT (OR MS21042-6) |
| 38 | | | 18 | AN960JD616 | WASHER |
| 39 | | | 2 | * D3189-1 | CHAFING SHIELD |
| 50 | 1 | 1 | | D3428-1 | PLACARD |

*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-141/-241 OR D412-664-243 ASSEMBLIES ABOVE
 NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AA
 SKIDTUBES.



LIQUID PENETRANT TEST REPORT

P- 05609

PAGE 1 OF 1

CLIENT DART AEROSPACE DATE MAY-18-2011 TIME AM ☐ PM ☐

ATTENTION LYNDA LUCILLE CHASTINE/IAN ACUREN JOB NO. 188-11-02128

ADDRESS 1270, ABERDEEN RD PO/NO. 14117

HAUKES BURY ON WORK LOCATION AS ADDRESSED

ACCEPTANCE STD. ASTM M17 CSE-033 REV./DATE 2005

PROJECT WET FLUORESCENT LIQUID PENETRANT INSPECTION ON 4 X "CROSSBARS"

EM(S) EXAMINED - SEE BELOW

OB DESCRIPTION PROCEDURE NO. LT003 REV./DATE 2008 TECHNIQUE NO. LT-002 REV./DATE 2008

ART NO. COPE MATERIAL C15 THICKNESS N/A

PERFORMED A WET-FLUO L.P.T. ON 100% OF THE EXTERNAL SURFACE
ON 4 X "CROSSBARS"

TEST DETAILS

| | | | | | |
|------------------|---|----------------------------------|-------------------------------------|--|--|
| METHOD | <input checked="" type="checkbox"/> FLUORESCENT | <input type="checkbox"/> VISIBLE | <input type="checkbox"/> WATER WASH | <input type="checkbox"/> SOLVENT REMOVABLE | <input type="checkbox"/> POST EMULSIFIED |
| AMILY BRAND | <u>MAGNADUX</u> | | BLACK LIGHT S/N | <u>13798</u> | <input type="checkbox"/> OUTPUT > 1000 μ W/cm ² |
| ENETRANT | <u>21-62</u> | MINIMUM DWELL TIME | 10 | MIN. | <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE |
| ENETRANT REMOVER | <u>A20</u> | MINIMUM DRY TIME | >10 | MIN. | OTHER |
| VELOPER | <u>SKD-53</u> | MINIMUM DWELL TIME | 10 | MIN. | LIGHT METER S/N |
| VELOPER TYPE | <input checked="" type="checkbox"/> NON AQUEOUS | <input type="checkbox"/> AQUEOUS | <input type="checkbox"/> DRY | | CAL DUE DATE <u>11/15/2011</u> |

TEST SURFACE

| | | | | | |
|---------------------|--|---|---|---------------------------------------|--|
| SURFACE CONDITION | <input type="checkbox"/> AS GROUND | <input type="checkbox"/> AS WELDED | <input type="checkbox"/> MACHINED | <input type="checkbox"/> SHOT BLASTED | <input checked="" type="checkbox"/> CLEAN BARE METAL |
| SURFACE TEMPERATURE | <input type="checkbox"/> < - 4°C/ 20°F | <input type="checkbox"/> - 4°C/ 20°F TO 10°C/50°F | <input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F | <input type="checkbox"/> > 52°C/125°F | |

RESULTS- ☐ METRIC ☐ IMPERIAL

ITEM ID

| | | | | |
|---|------------------------|---|----------------|------|
| 1 | Crossbar W.O. ID C8613 | ✓ | D212 - 664-201 | AFT |
| 2 | " W.O. ID C8614 | ✓ | D212 - 664-201 | AFT |
| 3 | " W.O. ID 69333 | ✓ | D212 - 664-101 | FOOD |
| 4 | " W.O. ID 69335 | ✓ | D212 - 664-101 | FOOD |

NO RELEVANT INDICATION WAS DETECTED
AS PER APPLICABLE STANDARD

ET 11-05-18

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the customer/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the customer/operator and the customer/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

| | | | |
|-------------------------|---------------------------|---------------------|----------------------|
| CLIENT REPRESENTATIVE | <u>Ian Tiley</u> | SIGNATURE | DTR # <u>E 44656</u> |
| TECHNICIAN (SIGNATURE): | <u>[Signature]</u> | REPORT REVIEWED BY: | |
| NAME (PRINT): | <u>Wesley [Signature]</u> | NAME | INITIALS |
| CGSB LEVEL | <u>2</u> | SNT LEVEL | |
| CGSB REG. NO. | <u>3044</u> | CGSB LEVEL | |
| | | SNT LEVEL | |
| | | CGSB REG. NO. | |

